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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/743,315

Applicant(s)

PRETLOVE ET AL.

Examiner

Paul Saunders

Art Unit

2609

– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 1/5/2005
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Interactive and Shared Augmented Reality System and Method having Local and Remote Access.

Claim Objections

1. **Claims 10, 12, 24, 33** objected to because of the following informalities.

Appropriate correction is required.

As to **claim 10**, it fails to depend on a previous claim in which claim 11 does not precede claim 10. It is suggested to make claim 10 depend on 10, renumber claim 10 to 11 and claim 11 to 10.

As to **claim 12**, it is suggested to change the phrase "**A** The system" to "The system."

As to **claim 24**, it is suggested to change the phrase "being arranged in a **fix** relation" to "being arranged in a **fixed** relation." Also there is no antecedent basis for "**the** local display device." It is suggested to remove the antecedence by changing it to "a local display device."

As to **claim 33**, it is suggested to change the phrase "Use of the **method**" to "Use of the **system**" as it depends on claim 1.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 1-29, 33** rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application No. 2002/0010734 A1 of Ebersole et al. ("Ebersole") in view of U.S. Patent Application No. 2002/0082498 A1 of Wendt et al. ("Wendt").

As to **claim 1**, Ebersole discloses an augmented reality system (Title) comprising: a camera 34 for capturing an image, the camera being movably located at a local site (fig. 3, page 2 [0030] lines 1-2, 15-18, page 5 [0059] – local AR station viewpoint is transmitted to a Remote Station such as a Remote AR Station in which the user is remotely located which requires a video see-through AR system), a registering unit 32, generating graphics and registering the generated graphics to the image from the camera, to provide a composite augmented reality image (figs. 5-6), a display device 32 located at a remote site, physically separated from the local site (page 2 [0025] lines 10-13), for displaying a view comprising the composite augmented reality image (fig. 3, page 2 [0028] lines 2-4 – AR display system), and a communication link 2, for communication of information between the local and the remote site (fig. 1, page 3 [0032]), wherein the system further comprises a specifying unit 33, for specification of a position

and an orientation in the remote site (fig. 2, 3, page 2 [0029] lines 1-2, page 5 [0059] – considering a Remote AR Station 1, 6 in which the head worn display specifies a position and orientation), and the registering unit is adapted for registering the generated graphics to the image in dependence of the specified position and orientation (page 3 [0034] lines 15-22).

Ebersole does not expressly disclose the camera being movably located at a local site; the camera is arranged such that its position and orientation is dependent on the specified position and orientation. He does not fully disclose the implementation of a Remote AR Station 1, 6 (fig. 2, 3), specifically how the Remote AR Station 1, 6 obtains its view in the Local AR Station 3 i.e. through a camera on a another person, or a remote controlled robotic arm or vehicle.

Wendt discloses an augmented reality system comprising: a camera 64 for capturing an image, the camera being movably located at a local site (fig. 6, page 4 [0056] lines 1-2), a display device 66 located at a remote site (fig. 6), the camera is arranged such that its position and orientation is dependent on the specified position and orientation (page 4 [0055-0057]).

Ebersole and Wendt are analogous art because they are from the same field of endeavor namely augmented reality systems.

At the time of the invention it would have been obvious to one of ordinary skill in the art to modify the previous Remote AR Station to obtain its view in the Local AR Station by means of a camera mounted on a robotic arm located in the Local AR Station as taught above by Wendt. The motivation would have been to

enable independent movement and operation of the remote user in the Local AR Station (Wendt page 4 [0057]).

Therefore it would have been obvious to combine Ebersole and Wendt to obtain the above modifications.

As to **claim 2**, Ebersole discloses the system according to claim 1, wherein said specifying unit 33 comprises a tracking unit 47, adapted for determining the position and orientation of a movable device 45 (page 2 [0029] lines 1-2) located at the remote site (fig. 3, 4, page 5 [0059] – considering a Remote AR Station 6), the registering unit is adapted for registering the generated graphics to the image in dependence of the position and orientation of the movable device, and the camera is arranged such that its position and orientation are dependent on the position and orientation of the movable device.

As to **claim 3**, Ebersole discloses the system according to claim 2, wherein said movable device is the display device 45.

As to **claim 4**, Wendt discloses the system according to claim 1, further comprising a robot 62 located at the local site (fig. 6), the camera is mounted on the robot 62 and the robot is arranged in such a manner that the movement of the robot depends on the specified position and orientation (page 4 [0057]).

The same motivation is used here as is used in the parent claim.

As to **claim 5**, Ebersole discloses the system according to claim 1, further comprising a graphical generator, for generation of a graphical representation,

and the registering unit is adapted for generating graphics based on the graphical representation (figs. 6-8, 10, page 2 [0028]).

As to **claim 6**, Ebersole discloses the system according to claim 1, further comprising operator input means 35, located at the remote site (considering the Remote AR Station), provided for feeding data related to the graphics to be displayed to the system, and the system is adapted for generating the graphics based on said data (fig. 3, 4, 6, page [0039]).

As to **claim 7**, Ebersole discloses the system according to claim 6, wherein said operator input means comprises a pointing device and a tracking unit for determining the position of the pointing device and that the system is adapted for generating a graphical representation of a point being presently pointed out by the pointing member based on the position of the pointing device (page 2 [0031] , page 4 [0050] lines 16+ – for example a mouse is a pointing device that has tracking means, wherein further when placing an object at a specific point that point has a graphical representation).

As to **claim 8**, Ebersole discloses the system according to claim 1, further comprising a second specifying unit 33, for specifying a position and an orientation in the local site (fig. 2, 3, page 2 [0029] lines 1-2 – considering a second Local AR station 4, 6), a second registering unit 32, generating graphics and registering the generated graphics to the real environment or an image of the environment of the local site (page 3 [0034] lines 15-22), in dependence of the position and orientation specified by the second specifying unit, and a local

display device 32 adapted for displaying a view comprising the environment of the local site and said generated graphics projected on the environment (fig. 3, page 2 [0028] lines 2-4).

As to **claim 9**, Ebersole discloses the system according to claim 8, further comprising a second movable device 47 located at the local site 4, 6, the second specifying unit comprises a second tracking unit 47, for determining the position and the orientation of the second movable device 45 (figs. 2-4 – considering a second Local AR Station 4, 6).

As to **claim 10**, Ebersole discloses the system according to claim 11, wherein said second movable device 47 is the local display device 47.

As to **claim 11**, Ebersole discloses the system according claim 9, further comprising a second camera 34a for capturing an image, the camera 34a being arranged in a fix relation to the second movable device 45, and the second registering unit, is adapted for registering the generated graphics to the image from the second camera, to provide a composite augmented reality image, and that the local display device 45 is adapted for displaying a view comprising the composite augmented reality image (fig. 3, 4, page 2 [0030] lines 1-2, 15-18 – a video see-through device as disclosed).

As to **claim 12**, Ebersole discloses the system according to claim 8, wherein the remote display device is adapted for displaying a view seen from a first visual angle that depends on the position and orientation received from the first mentioned specifying unit and the local display device is adapted for

displaying the same view as the remote display device seen from a second visual angle that depends on the position and orientation received from the second specifying unit (Title, Abstract, page 5 [0057] – internetworked AR).

As to **claim 13**, Ebersole discloses the system according to claim 1, further comprising means for transferring voices between the remote and the local site via the communication link 2 (page 2 [0025] lines 15-16, page 6 [0060]).

As to **claim 14**, Ebersole discloses the system according to claim 1, wherein the communication link is a network (fig. 1, page 3 [0032]).

As to **claim 15**, Ebersole discloses a method for remotely displaying an augmented reality view comprising graphical information overlaid an image captured at a local site (figs. 6, 8-10), the method comprising: specifying a position and an orientation at a remote site (fig. 2, 3, page 2 [0029] lines 1-2, page 5 [0059] – considering a remote AR station 1, 6 in which the head worn display specifies a position and orientation) that is physically separated from the local site (page [0025] lines 10-13), obtaining an image from the camera, generating graphics, generating a composite augmented reality image based on the image, the graphics, and the specified position and orientation, and displaying a view comprising the composite augmented reality image (fig. 3, 5, 6, 7, 10, page 2 [0028]).

Ebersole does not expressly disclose positioning and orientating a camera, located at the local site, according to the specified position and orientation.

Wendt discloses positioning and orientating a camera 64, located at the local site (fig. 6, page 4 [0056] lines 1-2), according to the specified position and orientation (page 4 [0055-0057]).

Ebersole and Wendt are analogous art because they are from the same field of endeavor namely augmented reality systems.

At the time of the invention it would have been obvious to one of ordinary skill in the art to modify the previous Remote AR Station 1, 6 camera 34 to be located and moveable in the Local AR Station 3 (Ebersole fig. 2, 3) as taught above by Wendt. The motivation would have been to enable independent movement and operation of the remote user in the Local AR Station (Wendt page 4 [0057]).

Therefore it would have been obvious to combine Ebersole and Wendt to obtain the above modifications.

As to **claim 16**, Ebersole discloses the method according to claim 15, wherein specifying a position and an orientation comprises determining the position and orientation of a movable device 45 (page 2 [0029] lines 1-2) located at the remote site (fig. 3, 4, page 5 [0059] – considering a Remote AR Station 6) and the camera is positioned and orientated according to the position and orientation of the movable device.

As to **claim 17**, Ebersole discloses the method according to claim 16, wherein said movable device is a remote display device and that said view

comprising the composite augmented reality image is displayed on the remote display device (fig. 3, page 2 [0028] lines 2-4 – AR display system).

As to **claim 18**, Wendt discloses the method according to claim 15, further comprising controlling the movements of a robot 62 (page 4 [0056-0058]), having the camera 64 mounted thereon (fig. 6), according to the position and orientation of the movable device (page 4 [0057]).

The same motivation is used here as is used for the parent claim.

As to **claim 19**, Ebersole discloses the method according to claim 15, further comprising obtaining data related to the graphics to be displayed, and generating the graphics based on said data (fig. 3, 4, 6, page [0039]).

As to **claim 20**, Ebersole discloses the method according to claim 15, further comprising receiving information about the position of a pointing device and generating graphics representing a point, being presently pointed out by the pointing member, based on the position of the pointing device (page 2 [0031], page 4 [0050] lines 16+ – for example a mouse is a pointing device that has an identifiable position wherein generated virtual objects or graphics may be placed at the identified position to represent the identified position).

As to **claim 21**, Ebersole discloses the method according to claim 15, further comprising specifying a position and an orientation in the local site (fig. 2, 3 – considering a second Local AR Station 4, 6 using the tracking unit 33), and displaying a second view comprising the environment of the local site and the generated graphics projected on the environment in dependence of the locally

specified position and orientation (fig. 3, page 2 [0028] lines 2-4, page 3 [0034] lines 15-22).

As to **claim 22**, Ebersole discloses the method according to claim 21, wherein specifying a position and an orientation in the local site comprises determining the position and orientation of a second movable device 45 located at the local site (figs. 2-4, page 2 [0029] – considering a second Local AR Station 4, 6).

As to **claim 23**, Ebersole discloses the method according to claim 22, wherein the second movable device 45 is a local display device 45 and that said second view, comprising the environment of the local site and the graphics, is displayed on the local display device (figs. 2-4, page 2 [0029] – considering a second Local AR Station 4, 6).

As to **claim 24**, Ebersole discloses the method according to claim 22, further comprising capturing an image from a second camera 34a being arranged in a fix relation to the second movable device 45 (fig. 4), and registering the generated graphics to the image from the second camera, to provide a composite augmented reality image, and displaying a view comprising the composite augmented reality image on the local display device 45 (fig. 3, 4, page 2 [0030] lines 1-2, 15-18 – a video see-through device as disclosed).

As to **claim 25**, Ebersole discloses the method according to claim 21, further comprising generating second graphics and displaying the second view comprising the environment of the local site and the second graphics projected

on the environment in dependence of the specified position and orientation (fig. 3, page 2 [0028] lines 2-4, page 3 [0034] lines 15-22, 37-38, page 4 [0040] – an instructor do not have to be at the Local AR Station and often are at Remote Non-AR Stations and may be at a Remote AR Station and even Local AR Stations; they may also see a first-person view of any trainee in the AR).

As to **claim 26**, Ebbersole discloses the method according to claim 25, further comprising generating a local graphical representation, generating a remote graphical representation, transferring the local and remote graphical representations between the local and the remote site (fig. 1, page 3 [0032]), generating the first mentioned graphics based on the local and the remote graphical representation, and generating the second graphics based on the local and the remote graphical representation (page 3 [0037], page 4 [0042-0047], page 5 [0058-0060] – the collaboration of textual messages involves local and remote graphical representations in the form of text wherein when displayed they become a part of the local and remote graphics).

As to **claim 27**, Ebersole discloses the method according to claim 21, wherein the view displayed in the remote site comprises the environment of the local site and the overlaid graphics seen from an visual angle that depends on the position and orientation specified in the remote site and the view displayed in the local site comprises the environment of the local site and the overlaid graphics seen from an visual angle that depends on the position and orientation specified in the local site (Title, Abstract, page 5 [0057] – internetworked AR).

As to **claim 28**, Ebersole discloses a computer program product directly loadable into the internal memory of a computer, comprising software code portions for performing the steps of claim 15 (Appendix A), when said product is run on a computer 31 (fig. 3, page [0027] – for the AR system of multiple stations having computing systems 31 being PCs or better, they all must load the program of Appendix A into internal memory in order to run).

As to **claim 29**, Ebersole discloses a computer readable medium having a program recorded thereon, where the program is to make a computer perform the steps of claim 15 (Appendix A), when said program is run on the computer (fig. 2, 3, page [0027] – for the AR system of multiple stations having computing systems 31 being PCs or better, they all have a computer readable medium that stores the program of Appendix A such as a hard drive).

As to **claim 33**, Ebersole discloses use of the method according to claim 1 for a paint application (fig. 10, page 5 [0051-0053] – The application of color and texture to objects embody a paint application in the AR).

3. **Claim 30** rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application No. 2002/0010734 A1 of Ebersole et al. ("Ebersole") in view of U.S. Patent Application No. 2002/0082498 A1 of Wendt et al. ("Wendt") as applied to claim 1 above, and further in view of U.S. Patent No. 5,745,387 A to Corby, Jr. et al. ("Corby")

As to **claim 30**, it has not expressly been disclosed yet.

Corby discloses use of a system according to claim 1 for remote programming (col. 5 lines 29-53 – the remote operator may program intended paths of robot arm) of an industrial robot 10-14.

Ebersole and Corby are analogous art because they are from the same field of endeavor namely augmented reality systems.

At the time of the invention it would have been obvious to one of ordinary skill in the art to modify the previous robot arm to be automatic and programmable as taught above by Corby. The motivation would have been to accurately and automatically position the robot arm (Corby col. 3 lines 34-40).

Therefore it would have been obvious to combine Ebersole, Wendt and Corby to obtain the above modifications.

4. **Claims 31-32** rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application No. 2002/0010734 A1 of Ebersole et al. ("Ebersole") in view of U.S. Patent Application No. 2002/0082498 A1 of Wendt et al. ("Wendt") as applied to claim 1 above, and further in view of U.S. Patent No. 5,815,411 A to Ellenby et al. ("Ellenby").

As to **claim 31**, it has not yet expressly been disclosed.

Ellenby discloses the system according to claim 11, further comprising a handheld display device (fig. 1) comprising the display member 13 and the camera 9 (figs. 1-4).

Ebersole and Ellenby are analogous art because they are from the same field of endeavor namely augmented reality systems.

At the time of the invention it would have been obvious to one of ordinary skill in the art to modify the previous AR display system to instead be a handheld tracked display like binoculars as taught above by Ellenby. The motivation would have been to allow the user to more naturally view the AR (Ellenby col. 3 line 63) as they normally would (Ellenby col. 9 lines 47-51) wherein certain situations a handheld device would be more natural to use than a head mountable display.

Therefore it would have been obvious to combine Ebersole, Wendt and Ellenby to obtain the above modifications.

As to **claim 32**, Ellenby further discloses the system according to claim 31, wherein the handheld display device is arranged so that the user seems to look directly through the display (Claim 4, col. 9 lines 47-51).

The same motivation is used here as is used in the parent claim.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

As to **claim 11**, U.S. Patent Application 2003/0003430 A1 of Ebersole et al. discloses a tracked pointing device.

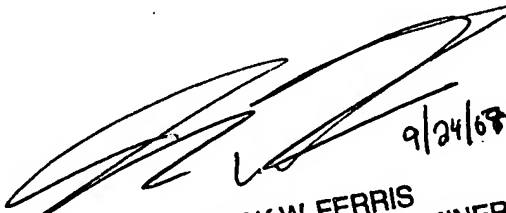
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul Saunders whose telephone number is 571.270.3319. The examiner can normally be reached on Mon-Thur 8:30am-4:00pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Derrick Ferris can be reached on 571.272.3123. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/PS/



9/24/08
DERRICK W. FERRIS
SUPERVISORY PATENT EXAMINER